



DECLARATION

I, Richard Craig, Ph.D., declare as follows:

1. I have Bachelor of Science and Master of Science Degrees in Horticulture and a Ph.D. Degree in Genetics from the Pennsylvania State University.
2. I have been a member of the faculty, currently as a Professor of Plant Breeding and The J. Franklin Styer Professor of Horticultural Botany, at The Pennsylvania State University for 39 years.
3. I am the inventor or co-inventor on two Utility Patents and 24 Plant Patents on Pelargonium. A complete list of my publications and patents is attached hereto.
4. The following definitions are provided for reference herein:

A **diploid** is an organism with one pair (two copies) of cytologically identical chromosomes that can pair during prophase of meiosis. Diploids of most organisms exhibit Mendelian (disomic) inheritance. Inbred lines are easy to produce and seed production of inbred cultivars and F1 hybrids are generally possible assuming no barrier to self- or cross-fertilization.

Haploid refers to the gametic chromosome number of a diploid organism. A haploid contains one-half of the number of chromosomes of the parent. In a diploid organism the haploid chromosome set is termed a **genome**; thus all of the genetic information that is representative of the organism is contained in a single genome.

A **polyploid** is an organism with more than one pair of each chromosome i.e., three, four, five, six or more of each chromosome is present; these chromosomes may or may not be cytologically identical. A polyploid may also be a plant of any of the above configurations that lacks or has extra individual chromosomes.

An **autotetraploid** is an organism with sets of four cytologically identical chromosomes that can pair during prophase of meiosis.

The **flower** is the site of all reproductive events in higher plants. Stamens include anthers that are the site of pollen formation. The pistil (stigma, style and ovary) is the site of maternal gamete formation. **Pollination** is the transfer of pollen from an anther to a stigma; **fertilization** is the process of gametic union.

5. A **sexually reproduced plant** is one that is produced from seed derived from the process of double fertilization in which a maternal egg cell (haploid) is fertilized by a paternal sperm cell (haploid) forming the diploid zygote. In a second fertilization, two fused haploid

maternal (polar) cells are fertilized by a haploid sperm cell forming the triploid endosperm, which ultimately serves as a nutritional resource for embryo development and/or subsequent germination events.

The maternal gamete is produced in the ovule of the pistil of the flower and more specifically in the embryo sac that is connected to the maternal tissue at a site called the placenta. The products of the ovule are derived from the maternal (also known as seed, pistillate, female) parent. The most internal tissue of the embryo sac contains the megaspore mother cell. The megaspore mother cell undergoes meiosis to form four haploid megaspores; three of these megaspores disintegrate and the remaining megaspore undergoes endomitotic divisions to form an eight-nucleate (other variations are possible) embryo sac. These nuclei/cells assume specific positions in the embryo sac and three of the nuclei, including the egg cell and two polar cells, are defined by their position.

Pollen is produced in the anthers of the stamens of the flower. Pollen utilized in double fertilization can be derived from either the same parent that contributes the egg (self-fertilization), or from a genetically distinct, unrelated plant (cross-fertilization). The sperm cells are produced from pollen (microspore) mother cells via meiosis to form four microspores, a successive endomitosis to form the vegetative and generative cells, followed by an amitosis to form the two sperm cells.

The zygote undergoes successive mitotic cell divisions to form an embryo. The embryo and endosperm are contained within the embryo sac. The embryo sac is enclosed within one or two integuments; these ultimately become the seed coat (testa). The entire structure is called the ovule; thus a seed is a mature (ripened) ovule

6. **Inbred lines** are normally produced through self-fertilization either of naturally self-fertilized species or through controlled self-fertilization of normally cross-fertilized species. During the process of inbred line development, progeny may be selected for desirable traits of commercial and/or scientific interest. The final seed-produced progeny are uniform for these traits.

Self-fertilization leads to genetic homozygosity (uniformity of alleles at a gene). With each generation of self-fertilization, heterozygosity of plants and genes (each and all genes) is decreased by 50%; conversely homozygosity is increased proportionally. After a certain number (5-7) of generations of self-fertilization, homozygosity of loci and plants approaches 100 % and progeny are phenotypically uniform for most traits.

Breeding progress (with the exception of homozygosity) may be impeded or affected by such phenomena as selection, epistasis (interaction of at least two genes affecting a single trait), linkage (genes segregating together), cytoplasmic inheritance (maternal or paternal influences are not caused by nuclear genes but by genetic elements in chloroplasts or mitochondria), and environmental influences.

Inbred lines may be used as parents of F1 hybrid cultivars. Inbred lines may also be used for inheritance as well as gene mapping studies.

It is crucial to recognize that not all species can be self-fertilized (or continually self-fertilized), that is, in many species inbred lines are not possible either commercially or scientifically. Reasons for lack of ability to self-fertilize may be dioecy (maternal and paternal gametes produced on separate plants), inbreeding depression (the loss of vigor or fertility due to self-fertilization), self-incompatibility (viable pollen which is incapable of fertilizing a plant with similar "incompatibility" alleles), or various gametic and/or zygotic sterilities. In these cases only cross-fertilizations are usually possible.

7. An **F1 hybrid** is the sexually reproduced progeny developed from the cross-fertilization of two inbred parents (true breeding and genetically homozygous for traits of commercial and/or scientific interest). The parents usually have different genetic (allelic) constitutions and the F1 hybrids are heterozygous for all genes that are polymorphic between the two parents. In contrast to the genetic heterozygosity of F1 plants, the progeny thereof are homogeneous in appearance because they share the same genetic constitution. Conversely F1 hybrids will not produce uniform progeny upon self- or cross-fertilization. All genes that are heterozygous in the F1 hybrids (polymorphic between the original parents) segregate in the succeeding generations. Once an F1 hybrid is created, it may also be asexually propagated and cloned.
8. The term **hybrid** can be applied to any sexually reproduced progeny resulting from the cross-fertilization of two or more parents regardless of the origin or genetic constitution of those parents. The parents may be of different genera (intergeneric hybrids), different species (interspecific hybrids), different botanical varieties (intervarietal hybrids), different cultivars, different breeding lines, etc. Hybrids result from double fertilization with the sperm cells (pollen) contributed by one parent and the egg cells contributed by a second parent. With the exception of F1 hybrids and inbred lines, cross-fertilization and indeed self-fertilization of most plants produces heterozygous and heterogeneous progeny. In most instances, every progeny will be different from every other both genotypically (genetic constitution) and phenotypically (traits).

This non-uniformity is normal in species that are **diploid**. Thus, when one makes a cross-fertilization of heterozygous parents, one cannot predict the specific combination of traits in the progeny. When a large number of genes have different allelic combinations in the parents, the possible genotypic combinations in the hybrid progeny approach infinity.

Such genotypic diversity among hybrids is magnified when species are **polyploid** - having more than two identical genomes. Thus, each gene is present in more than two copies leading to an exponential number of phenotypes in the progeny. Many fruit and ornamental plants are polyploid in origin and indeed are polyploid in cultivation. This polyploidy often is accompanied by positive phenotypic characteristics such as larger fruit, improved keeping quality, etc. When these species are cross or self-fertilized, they produce highly heterozygous and heterogeneous progeny. The possible combination of genes is infinite.

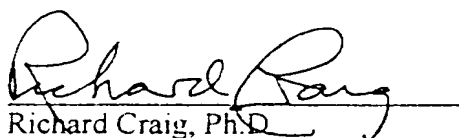
For these reasons, polyploidy and genetic heterozygosity, many cultivars can only be propagated (replicated, cloned) through asexual processes for commercial production.

9. An asexually reproduced plant is produced from cells, tissues, or organs of a mother plant without the process of fertilization. Asexual propagation may occur through cuttings with adventitious roots, physical divisions, runners, layering, grafting, tissue culture, bulbs, corms, tubers, adventitious embryony, and apomixis. Adventitious embryony is the production of embryos from somatic tissues; these are entirely maternal in origin and genetic constitution. Apomixis (parthenogenesis) is the asexual production of seed from solely maternal tissues via specialized processes. When a single progeny or an infinite number of progeny are asexually produced directly from a single mother plant, this is defined as cloning and the progeny are termed clones. With the rare exception of somatic mutations all clones share the same genetic constitution, and are exactly identical to the mother plant.

10. Starting only from a photograph or a written description of a particular cultivar, a plant breeder cannot reproduce the cultivar. No person can independently create through fertilization and hybridization the exact genetic replica of another plant.

Without access to the actual desired plant (or an actual plant of an inbred cultivar or the inbred parents of an F1 hybrid cultivar), the only route to recreating the particular cultivar is to self- or cross-fertilize various parental plants until the desired genotype is somehow recreated. The number of combinations of genes and resulting genotypes from hybridization of diverse parents approaches infinity. Even when the parents of the desired cultivar are known (i.e. the starting materials for recreating the cultivar are known), hybridization thereof still involves the potential for essentially infinite combinations of genes. Hence, such an attempt to recreate a particular cultivar is futile.

11. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both, under Section 1001 of Title 18 of the United States code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.


Richard Craig, Ph.D.

1/5/02
Date



22 APPLICATION OF EDWARD BURTON LEGRICE

28 Decision of Board of Appeals, February 12, 1960

The above identified applications involving the identical legal question are being considered simultaneously on appeal. Each is an application for a plant patent having the customary single formal claim which in each case is directed to an assertedly new variety of rose plant.

In each case descriptions of the plant have appeared in printed publications more than one year prior to the filing of the applications. These have appeared, for one case, in The National Rose Society Annual of England for 1949 and for the other case in The National Rose Society Annual of England for 1954 (the applications were filed in 1958). Photocopies of pages of these Annuals are of record. In each case there are also catalogues published more than one year prior to the dates of the respective applications. The catalogues have not been made available but are admitted, pages 24 and 23 of the respective briefs, to "add to the information in the Rose Annual a reproduction in color of a color photograph of the variety."

In a paper filed November 19, 1959 in Appeal No. 269-46 requesting consolidation of the two appeals, appellant conceded that "the publications are thoroughly adequate in each instance to identify the plant as the plant in the particular application." A similar statement appears on page 3 in each of the reply briefs.

It may be noted that the various publications were acknowledged by appellant in the oaths accompanying the applications.

The publications indicate that the particular plants were on sale, and presumably also in public use, more than one year prior to the respective filing dates of the applications since appellant is indicated as "raiser and distributor." However this question is not in issue since the public use or sale must be in the United States in order to bar a patent and these events, as far as anything suggested by the record is concerned, took place in England. The single broad issue of the competency of a prior printed publication to bar a plant patent is presented.

The examiner has rejected the claim in each case
30 on the ground that the printed publications having effective dates more than one year prior to the filing dates of the instant applications constitute statutory bars to the grant of patents on the described varieties of rose plants. The applicable portion of 35 U. S. C. 102(b) reads:

"A person shall be entitled to a patent unless—

. . .

(b) the invention was . . . described in a printed publication in this or a foreign country . . . more than one year prior to the date of the application for patent in the United States, . . ."

The examiner held the above provision applicable to plant patents in view of Chapter 15—Plant Patents of the U. S. Code Title 35—Patents, which in section 161 states:

"The provisions of this title relating to patents for inventions shall apply to patents for plants, except as otherwise provided."

Appellant (bottom of page 13 of brief) recognizes that the plant patent act was "engrafted onto the existing patent laws" and their provisions, except for "greater liberality in the completeness of the disclosure," made applicable to plants. He states:

"There was no intent to change the meaning of the wording such as now included in the quoted paragraph 102 (b), as theretofore applied to patents on articles, machines, methods, and the like. There is no evidence that it was intended that these words were to be interpreted differently in connection with plants."

It is evident from the preceding that appellant does not challenge the point so vigorously stressed by the examiner, namely the applicability of 35 U. S. C. 102(b) to plant patents. The premise of this appeal is simply that a publication describing a plant cannot, no matter how

31 complete, enable anyone to practice the invention (produce the plant); consequently such publication can never bar a plant patent under 35 U. S. C. 102(b). This result is said to follow from a consideration of the standard applied in patents for inventions, namely that in order to defeat such patents the printed publication advanced as a bar must be sufficient to enable one skilled in the particular art concerned to practice the invention, i.e., to produce the final useful result; *Wisconsin Alumni Research Foundation v. George A. Breon & Co.*, 30 USPQ 242, 85 F. (2d) 166, CCA 8 (1936); *Dewey & Almy Chemical Co. v. Mimex Co., Inc.*, 52 USPQ 138, 124 F. (2d) 986, CCA 2 (1942); or knowledge of the article describing would teach a skillful mechanic some process of making it; *Cohn v. Corset Co.*, 93 U. S. 366, 23 L. Ed. 907 (1876); *In re Schaeffer*, 2 App. D. C. 1, 8 (1893). Since neither of these requirements is met by a published description of a plant it is contended such publication must by application of the same standard be held insufficient to bar the grant of a patent on the plant.

The examiner, while not seriously challenging the appellant's premise that a plant description cannot enable anyone to produce the plant (nor do we see any reason for questioning this premise), states that the language of the statute must be taken in its exact and unequivocal meaning otherwise the anomaly arises that plant publications must be totally ignored as printed publications. In fact, it would have the effect of wholly eliminating that particular provision from 35 U. S. C. 102(b) in the case of plant patents. The examiner further maintains that a prior description of an existing plant adequate to identify the plant
32 claimed would negative patentable novelty as not "a distinct and new variety" (35 U. S. C. 161).

As indicated by his reply brief the most that appellant would concede with respect to the effect of such publication is that it might constitute secondary evidence of the prior existence of the actual plant and sale thereof so as to constitute a statutory bar. He further suggests that this

secondary evidence could almost be accepted with little or no corroboration because the chances of any fraud on the public are extremely remote. As has been stated the use or sale of the plants in a foreign country would be irrelevant.

Appellant contends it is absurd to hold that in one case (mechanical) a disclosure must be an enabling disclosure while in another (plant) it need not be. The examiner's "strict literal interpretation" above is (page 13 of brief) alleged to defeat the intent of the plant patent law which is to reward practical results and perpetuate the thing patented after expiration of the patent. Since no one could produce the plant from a written description it is alleged that this result can be assured only by grant of a patent which in turn would encourage the inventor to distribute the plant widely and thereby minimize the possibility of its loss or destruction. With respect to the remark concerning absurdity, it is no more absurd to use a disclosure which is not enabling as a bar than it is to grant a patent on such a disclosure; the disclosure in the specifications of these applications are admittedly just as unenabling as the disclosures of the publications as page 9 of the brief states that:

23 "The teaching in plant patent cases . . . cannot enable anyone, even the most skillful of plant breeders, to produce the particular plant."

Upon consideration of the issue here presented we have come to the conclusion that the examiner must be sustained. Concerning the alleged need for an enabling disclosure to constitute an anticipation, we direct attention to the fact that in the case of claims to an article (or compound), which a claim for a plant is admitted (page 8 of brief) to be most nearly like, disclosure of an operative method of making such article is not essential to constitute an anticipation. On this point we think appellant has misinterpreted the case law. *Cohn v. U. S. Corset Co.*, *supra*, relied upon by appellant did not require in the reference a

teaching of how to make the article. The Court of Appeals of the District of Columbia in the later decision *In re Decker*, 1911 C. D. 274, 162 O. G. 999, 36 App. D. C. 104, quoted *Cohn v. U. S. Corset Co.* as authority for the proposition that the inoperativeness of the reference procedure was immaterial to a consideration of the patentability of the article. A complete description of the article in the reference was held to be all that was required to defeat claims to such article. This ruling was followed in *In re Marden & Rentschler*, 18 CCPA 1119, 1931 C. D. 334, 409 O. G. 561, 48 F. (2d) 428, 8 USPQ 515, in an application involving claims for a ductible thorium wire.

That this principle remains controlling law will be evident from the more recent decisions. See for example *In re Attwood*, 45 CCPA 824, 1958 C. D. 204, 730 O. G. 790, 253 F. (2d) 234, 117 USPQ 184, involving claims to U-shaped metallic channel member as a concrete insert.

24 The Court of Customs & Patent Appeals there stated:

"... it is well settled that where the article claimed is disclosed in a prior patent, the claim may be rejected on that patent notwithstanding the fact that the process by which the patentee claimed the product could be produced is inoperative. *In re Marden and Rentschler*, 18 C. C. P. A. (Patents) 1119, 48 F. 2d 428, 8 U. S. Pat. Q. 515; *In re Von Bramer et al.*, 29 C. C. P. A. (Patents) 1013, 1024, 127 F. 2d 149, 53 USPQ 345. Clearly, appellant can stand in no better position where the patentee discloses no process for making the article claimed or where appellant can not discern from the patent disclosure how to construct the article as disclosed."

In *In re Crosley et al.*, 34 CCPA 882, 1947 C. D. 216, 600 O. G. 172, 159 F. (2d) 735, 72 USPQ 499, the same court stated:

"Furthermore, this court is committed to the doctrine that where a product is clearly disclosed in a

publication, the operativeness of any of the processes by which it is claimed the product could be produced is immaterial, and that the disclosure of the composition is sufficient to anticipate a claim therefor."

The U. S. Court of Appeals, District of Columbia Circuit still follows the same rule. See for example *Merck & Co., Inc. v. Marzall*, 1952 C. D. 35, 661 O. G. 576, 197 F. (2d) 206, 93 USPQ 355, wherein this court stated:

"We are dealing solely with an application for a patent on the compound itself. Such an application must be denied if there has been any prior disclosure of the compound, even though no practical means for its isolation or manufacture was previously known. R. S. 4886, 35 U. S. C. § 31; *Eastman Kodak Co. v. Coe*, 78 U. S. App. D. C. 403, 135 F. (2d) 536."

Since appellant has admitted that the reference publications in these cases adequately identify the claimed plants it follows from these holdings that the appealed claims were properly rejected regardless of the question of sufficiency of the reference disclosures as to how
35 to produce the plants. The decisions demonstrate that there is no inconsistency in this instance between what properly constitutes a publication under 35 U. S. C. 102(b) in mechanical cases (patents for inventions) and the examiner's application of the references to the claims in the instant plant patent cases.

The decision of the examiner is affirmed.

AFFIRMED

L. P. McCANN)	
Examiner-in-Chief)	
)	
P. J. FEDERICO)	BOARD
Examiner-in-Chief)	OF
)	APPEALS
N. A. ASP)	
Examiner-in-Chief)	